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Dinoflagellate cysts as sea-level and water depth indicators: Upper Cretaceous of Culver Cliff, Isle of Wight, UK

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The Late Cretaceous was characterised by the largest eustatic high-stand in the last 250 Myr, with sea-levels rising up to 200 – 300 m above those of the present day, resulting in the widespread flooding of continental interiors and a dominance of open-ocean over terrestrial processes in marginal and epicontinental seas. The first-order sea-level rise that took place through the Cenomanian (99.6 – 93.5 Ma), in particular, resulted in the widespread deposition of open marine sediments in inner shelf environments and is represented by the onset of chalk sedimentation throughout Europe. The Cenomanian successions in England are some of the best documented sections of this age in the World, and yield well-preserved dinocyst assemblages that provide a record of the response of organic walled plankton to environmental change.

The Cenomanian Chalk succession at Culver Cliff on the Isle of Wight in southern England is being used as a starting point for a larger study aiming to develop models that quantify sea-level change and water depth based on spatial and temporal trends in dinoflagellate cyst assemblages. The Late Cretaceous provides an excellent opportunity to examine the dinocyst response to these controls, because other major environmental influences such as large changes in salinity or siliciclastic input were minimal. A quantitative analysis of dinocyst assemblages in 125 samples collected at approximately 1 m intervals though the Cenomanian and basal Turonian at Culver Cliff has been undertaken. Results will be presented and compared with lithostratigraphic, biostratigraphic, sequence stratigraphic, and chemostratigraphic frameworks established previously for the section. The effects of sea-level change on the dinocyst assemblages

will be assessed. This is the first step in a wider comparison of dinocyst trends to sea-level change from contrasting stratigraphic intervals in geologically widely separated areas that will enable relationships to be identified and quantified. Dinocysts have been shown to correlate with various environmental parameters, and it is only by integrating stratigraphic, sedimentological, palaeontological and geochemical data that individual factors can be isolated and assessed. It is aimed to produce a model that will provide a basis for interpreting dinocyst assemblages as sea-level and water depth proxies.